PLASTICS & MOLDED PRODUCTS

Volume 8 MARCH 1932 Number 3

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Reg. U. S. Pat. Off.

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PLASTICS & MOLDED PRODUCTS

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Volume 8 MARCH, 1932 Number 3

The Latest in Molded Packaging

The refillable, permanent container and the ensemble idea are new developments in packaging stimulated by plastics

By H. S. Spencer

Advertising Manager, General Plastics, Inc.

THE year just past was an important one for the packaging world, several new thoughts having been developed and exploited, with a great deal of interest focussed on Plastics. Never before has packaging been so much in the limelight. And never before has the swing from the traditional and the search for new ideas been so marked.

There was a time when a product retained the package in which it was born down through generation after generation. But that viewpoint has changed. The public has been so thoroughly sold on the dangers of Obsolescence that manufacturers are striving to make their packages *look* modern—even sacrificing well-known forms to obtain it. Products may go on forever, but packages must come and go.

The original ideas of the packaging reform movement demanded better appearance, and several mechanical improvements. The materials formerly in use had reached the end of their rope, and the call was for new materials — plastic materials—with which to effect simplification of design and improvement of function. This proved to be the opportunity for Durez. It satisfied the designer's demand for a material which could be formed exactly as he drew his sketch, and it satisfied the production man at the same time. Along with Cellophane, resinoids were accepted by the packaging world, and these synthetic products are really the only new materials placed at the disposal of the package designer in the last decade.

The Permanent Package

A great advantage which Durez offered packers was the feature of permanency. Durez containers are attractive enough to make the consumer keep the package after the contents had been used, lending either memory-value or secondary use to the original function of the container. This fondness of the public for Durez pieces in any form was realized when it was discovered that consumers retained bottles capped with Durez closures, refilling them with other liquids. Now this kink is being capitalized by packers in the container field. In the last year we saw many molded packages brought out with a definite re-use function: such as Johnson & Johnson's Couette (cleaning pad) box, which could be refilled with Couettes or be used as a dressing-table cigarette container. Hickok Belt did likewise, packaging their belt sets in very attractive molded containers, and stating that they could be used for keeping cigarettes or trinkets after purchase. Pinaud's molded powder box was also made with a definite refill idea, and they were right in their assumption that the user would keep the ultra-smart container on her dresser if to be refilled only with hairpins. The sales value of these molded boxes is tremendous. Besides clinching sales in the retail store, they either provide automatic reminders to buy more of the same brand, or they take the form of a permanent goodwill offering of the packer.

Variations of the Re-use Idea are numerous in the molded container field. Parker Pen Company adopted a black-and-gold Durez box for its pen-and-pencil sets, not because the box could be used for other purposes but because it provided a permanent dustproof receptacle for the writing instruments. It can be closed up at night, and it is expertly designed to harmonize with the finest office or home decorations. Then, too, the

One of newest applications for Durez in packaging: a display stand for Norwich's Pepto-Bismol which holds three bottles in easy reach of the soda clerk and in full sight of the customer.

sculptural display value of molded containers has successfully been exploited by Elgin Watch Co. in their combination box-and-display-stand, ingeniously worked out and molded by Norton Laboratories.

"Ensemble"

Still another packaging kink which gained much momentum in the past year is the "Ensemble" idea—the grouping of several related products into one package. Manicure set manufacturers have been the most alert to the sales advantages of this device. Coty has produced two very attractive ensemble packages, both of them molded, and both holding every item required in home manicure. A newer number in this category is the Culver Manicure Set, which in addition, includes the "Culver Nail Bath", molded of special inert Durez to resist the chemical action of the nail liquid. The "bath" is a small cylindrical receptacle into which the user pours the nail liquid through the hole in the soft rubber top, immersing the finger-tip. Other fingers can be manicured while the liquid does its work. The same package contains the polish and polish remover.

Dorothy Grey and Harriet Hubbard Ayer have also put out packages under the group idea, combining associated products in one container—"Harnessing the power of suggestion by means of the package", as J. H. Gilluley of Anchor Cap and Closure so aptly puts it. Ambrosia has done it in a competent manner by means of its complete skin treatment, combining a cleanser, a cream and a skin tightener, capping them all with artistically molded Durez closures to preserve identity and unity. This method automatically suggests the purchase of other products, far more effectively than the retail clerk's phrase, "Wouldn't you like one of these, too?" And from the plastics standpoint, the ensemble idea offers greater opportunity for permanent, beautifully-designed containers.

An interesting variation of the ensemble idea is the molded Durez display stand for Norwich Pharmacal's Pepto-Bismol, illustrated elsewhere in this article. This display holds the three bottles within easy reach of the soda-clerk's hand for ready dispensing in the customer's sight, and the words "For Upset Stomach" on the front of the stand constantly remind both customer and clerk of the product. The bottles are never misplaced, each one setting into its own little indentation.

Possibilities

There yet remains much to be done in using plastics in packaging to their fullest extent. Bottle caps can just as easily be measuring cups, to provide an ever-present dispenser. Eye-cups for bathing the eye can be molded into caps for these containers. DAG, a chlorine disinfectant, ingeniously worked out a combined cap-cup of Durez to measure doses, and finds that the package sells the product. Dozens of other packaging applications are merely waiting for discoverers.

Food manufacturers, in their fight to get their products used on the table, are turning more

(*Continued on page 129*)

More and more, food packers are turning to Durez molded caps to make their packages easy to use and attractive enough to be set on the dinner table, in keeping with the decorative standards set by the china, glass and silver ware.

The Prized Pearls of Industry*

A new lustrous beauty is given to merchandise by pearl essence, combined with pyroxylin plastics

By R. T. Ellis

Sales Promotion Manager, Du Pont Viscoid Co.

STYLES, designs and colors of today's products are continually changing to meet the public demand. When color swept into the bathroom, toilet seats, towels, hampers, towel bars, toothbrush handles and all other bathroom accessories instantly underwent a rejuvenation to make a more harmonious effect. And this wave of color was by no means limited to the sanitary field; fountain pens and toiletware, table knives and buttons have all been given that pearly effect which makes products so much more salable than heretofore. After all, salability is the main thing shrewd manufacturers are constantly on the lookout for; that something to make products more attractive to buyers.

A material has been found that gives to manufactured products a pearly luster. The only substance that has ever met this need satisfactorily is the silvery substance deposited in the skin of many species of fish. When scrubbed off the scales, freed from foreign matter and suspended in water or other suitable liquid, it is ready for use. And when incorporated properly in a pyroxylin plastic material, it gives the beautiful lustrous mother-of-pearl effect that is now rapidly coming into universal use in the manufacture of toiletware, toilet seats, fountain pens and a great variety of other products.

Probably few people know how this effect is obtained. By way of explanation, the material referred to is called pearl essence. In literature many vague references are made to its origin. Many books on pearls, in sections on imitations, mention the use of "ground-up fish scales." As a matter of fact, fish scales themselves do not enter directly into the manufacture of pearl essence. The lustrous ingredient is obtained from guanin crystals, which are not found in the scales but are deposited in the epidermis of the fish, parts of which adhere to the scales when they are removed. This epidermis is the source of the shiny crystals, and their removal is the first operation in the manufacture of the essence. By far, the greater amount of the lustrous substance remains on the fish and is never removed.

The scales are usually collected from the fisheries and washed in soap and water, while still fresh. The next step is to scrub off the lustrous material from them. This is done in a large agitator with a revolving member, like the old-fashioned ice-cream freezer. The crystals are disengaged from the scales and, being lighter than water, floats to the top, while the scales and dirt settle on the bottom.

Man-made pearls, as beautiful as Nature's own, and fountain pens of du Pont Pyralin reveal striking effects by the use of pearl essence.

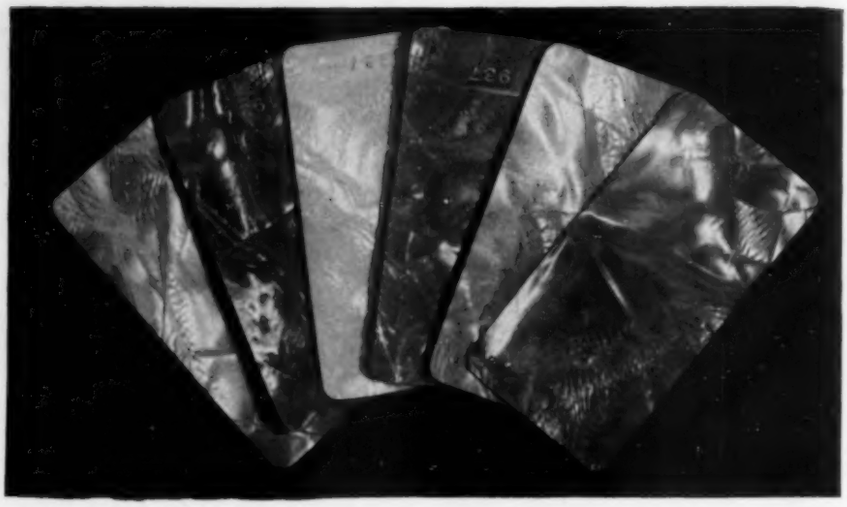
Varicolored, pearl finish pyroxylin-covered, toilet seats, bathroom stools and other accessories have come into considerable vogue.

The Finished Essence

Now comes the task of separating the lustrous substance from the wash water. For this purpose large revolving drum centrifugals are used, in which the liquid is thrown against the inside surface of the drum. The material thus collected is scraped out and put into a bath in which various chemicals are used as a degreasing agent. This removes the fatty matter, and after twenty-

*Reprinted from The Du Pont Magazine.

four hours the sediment is centrifuged again to remove the water and chemicals of the degreasing bath. To the paste remaining, ordinary clear lacquer is added and because these crystals have a greater affinity for an organic solvent than for water, they go into the solvent, leaving the dirt, chemicals and water behind. The pearl essence thus obtained, when mixed carefully under close chemical control with other ingredients used in the manufacture of Pyralin, produces the beautiful pearly effect noticed on various kinds of articles today.



A few samples of Pearl Pyralin. Black and white reproduction gives only a scant hint of the color effects achieved with this material.

Color Appeal

As never before, we are living in an age of color. Everywhere manufacturers are confronted with the problem of appealing to the public taste and of producing the type of merchandise that will of itself create a desire for its possession. Moreover, the success or salability of an ever-increasing number of products depends almost entirely on the direct appeal made to the esthetic sense of consumers.

Forward-looking manufacturers are saying, "Give us a material that lends itself to modern merchandising methods." Pearl Pyralin is being recognized more and more as this material. The adoption of mother-of-pearl finishes is the natural outgrowth of the desire for smarter-looking and more salable merchandise.

Wide Use of Pearl Effects

The use of pearl essence, which was formerly confined to the manufacture of imitation pearls and mother-of-pearl effects, has now entered practically every field that its lacquer vehicle embellishes. It is now recognized that the crystal of pearl essence, used in the manufacture of Pearl Pyralin, gives depth of color and brilliancy of color effects. A satin-like luster is obtained that formerly could only be achieved by individual artistry; in addition, new creations are obtained that were once strictly confined to Nature's own handiwork. Today, the most fastidious individuals can secure many of their personal articles and other necessities in creamy Pearl Pyralin finishes. And more and more people are buying them.

German Institute Reports Favorably On Use of Plastics in Airplane Building

Released By U. S. Department of Commerce

THE German Research Institute for Aeronautics at Berlin-Adlershof reviews, in its report for 1930, the results of tests of various materials for the construction of airplanes. An outstanding feature of this report, states a communication from the Bureau of Foreign and Domestic Commerce, is that the Institute is paying earnest attention to a possible use of synthetic plastics as the principal construction material. Further than that, it states that tests carried out with a number of synthetic plastics have showed them to be superior to the materials now commonly used, especially as contrasted with plywood. The superiority of such synthetic substances lies in their durability under severe atmospheric conditions and under the action of salt water. Tests consisting in exposure to the atmospheric influences for fifteen months and to the action of salt water for eight months, have demonstrated that some synthetic plastics may be regarded as practically proof against the destructive action of the atmosphere and of salt water.

Contrasted with wood most synthetic plastics exhibit a higher degree of homogeneity and lesser inflammability.

Research of the possibilities for reliable jointing of synthetic materials established that while joints could be made with special glues containing synthetic resins, with application of pressure and heat, such joints were not always sufficiently strong to answer the requirements of airplane construction. On the other hand, riveting with pure aluminum rivets gave more favorable results.

Report on Laminated Plates

More striking yet were the results of tests with laminated material made of synthetic plates with plywood inserts. One such plate exhibited modulus "E" of 250,000 kilograms per square centimeter or 85,270 pounds per square inch in one direction, and in diagonal direction produced modulus E double that of ordinary plywood.

Technology of Cellulose Acetate

Progress in the Preparation of this Cellulose Ester as Shown in the World's Patent Literature during the last Decade

By Dr. Aladin

Continuing this concise but comprehensive review of the world's patents on Cellulose Acetate which issued during the past decade, we now come to those patents which particularly relate to the

V. Hydrolysis of Cellulose Acetate

(*Continued from page 17, January 1932 issue*)

Serial No.	Patent No.	Patentee	Title	Brief of Description
198.	Brit. P. 292,398	Naam. Venn. Nederlandsche Kunstzijde Fabriek	Preparation of acetone-soluble cellulose acetate.	Finished cellulose triacetate is hydrolyzed at 20° by means of sulfuric acid, until the viscosity has increased one and one-half times.
199.	Brit. P. 298,819	J. W. Bulmer	Preparation of Cellulose Acetate.	The hydrolysis is effected by adding water to the acetylating bath. The acetate is then precipitated and further treated with dilute acids until it has attained the desired degree of hydrolysis.
200.	Brit. P. 299,326	I. G. Farbenindustrie A.-G.	Preparation of stable cellulose esters.	Unstable cellulose esters such as the acetate are treated below 100°C. with hydrolyzing agents such as dilute alcoholic or aqueous sulfuric acid.
201.	Brit. P. 303,098	Ruth-Aldo Co. Inc. (H. L. Barthelemy)	Preparation of cellulose esters.	The hydrolysis is effected by means of hydrochloric or hydrofluoric acid. The excess acetic anhydride in the acetylating bath is first destroyed by adding acetic or formic acid, and the further amounts of these acids, containing the said mineral acids are added.
202.	Brit. P. 307,392	Ruth-Aldo Co. Inc.	Reducing the viscosity of cellulose ester solutions.	Gall, or one of its constituents, such as cholesterin, is used as a constituent of the cellulose ester solutions.
203.	Brit. P. 312,232	I. G. Farbenindustrie A.-G.	Conversion of cellulose acetate.	Primary cellulose acetate is rendered acetone-soluble by treatment with dilute mineral acids, such for example as 10% nitric acid containing from 0.5 to 1% of sulfuric acid.
204.	Brit. P. 313,091	Imperial Chemical Industries, Ltd. (E. E. Reid)	Reducing the viscosity of cellulose esters and ethers.	The dry ester or ether is treated with the vapors of an acid until about 0.1-5% thereof has been absorbed; whereupon the material is allowed to remain at rest until samples show the desired viscosity, after which the material is washed with water to remove the acid; and is then dried.
205.	F. P. 630,991	H. Pringsheim	Converting cellulose acetate.	See Brit. P. 267,596 (No. 195)
206.	F. P. 631,343	H. Dreyfus	Preparation of cellulose esters for films, etc.	See Brit. P. 275,286 (No. 197)
207.	F. P. 642,909	Naam. Venn. Nederlandsche Kunstzijde Fabriek	Preparation of acetone-soluble cellulose acetate.	See Brit. P. 292,398 (No. 198)
208.	F. P. 660,376	Ruth-Aldo Co. Inc.	Preparation of cellulose esters.	See Brit. P. 303,098 (No. 201)
209.	F. P. 661,935	Dr. A. Wacker, Ges. für elektrochemische Industrie, m. b. H.	Preparation of viscous but acetone-soluble cellulose acetate.	See U. S. P. 1,723,614 (No. 191)
210.	F. P. 662,353	I. G. Farbenindustrie A.-G.	Preparation of stable cellulose esters.	See Brit. P. 299,326 (No. 200)

Serial No.	Patent No.	Patentee	Title	Brief of Description
211.	F. P. 666,084	J. W. Bulmer	Preparation of cellulose acetate.	See Brit. P. 298,819 (No. 199)
212.	Swiss P. 127,790	H. Dreyfus	Preparation of cellulose esters for films, filaments, etc.	See Brit. P. 275,286 (No. 197)

VI. Manipulative Details, Acid Recovery, Etc.

213. U. S. P. 1,456,781	E. I. Du Pont de Nemours & Co.	Recovery of cellulose acetate from its solutions.	The solutions are extruded through fine openings into an ether in order to precipitate the cellulose acetate.
214. U. S. P. 1,494,816	P. C. Seel	Manufacture of cellulose acetate.	The glacial acetic acid and the acetic anhydride contained in the acetating bath are removed by blowing hot air through the latter, the acid and anhydride being condensed; the cellulose acetate separates as a powder.
215. U. S. P. 1,494,830	R. W. Cook	Preparation of cellulose acetate.	In order to recover the acetic anhydride and glacial acetic acid from the acetating bath the latter is treated in thin layers with hot air; the volatilized products being condensed. The residual cellulose acetate is very openly porous and hence in good condition for further treatment.
216. U. S. P. 1,514,274	W. R. Webb (Eastman Kodak Co.)	Preparation of cellulose acetate.	By introducing heated gases into the spent acetating bath, the therein contained acetic acid and acetic anhydride are driven off. The gases are passed through a container containing sodium acetate in order to remove any entrained volatile mineral acids. The acetic acid and anhydride are then condensed.
217. U. S. P. 1,516,225	W. R. Webb (Eastman Kodak Co.)	Preparation of cellulose acetate.	The acetylating bath containing the freshly formed cellulose acetate is sprayed into a chamber by means of heated air, where the acid and anhydride volatilize while the cellulose acetate settles to the bottom of the chamber as a powder.
218. U. S. P. 1,536,311	P. C. Seel (Eastman Kodak Co.)	Preparation of cellulose acetate.	A current of hot air is passed through the acetating bath to entrain the glacial acetic acid and the anhydride. The gases are passed through a condenser to condense these products, and are then reheated and again introduced into the bath. The cellulose separates as a powder.
219. U. S. P. 1,536,312	P. C. Seel (Eastman Kodak Co.)	Recovery of acetic acid from crude cellulose acetate.	Raw pulverulent cellulose acetate such as is obtained by the processes in the patents immediately hereinabove, i. e. by passing hot gases through the acetatating bath, contains about 30% of acetic acid. This is recovered by grinding the acetate in a closed mill while circulating heated gases through the same, which carry off the acetic acid. The same is condensed at one stage of the cycle by cooling the gases; which are their reheated and used again.
220. U. S. P. 1,536,334	E. S. Farrow, Jr. (Eastman Kodak Co.)	Recovery of acetic acid from acetylating baths.	The acetylating mixture or powdered raw cellulose acetate is mixed with an alcohol in which the acetate is insoluble, but which is capable of forming a volatile acetate, such as ethyl alcohol, methylalcohol, propyl alcohol, etc. The ester (such as ethyl acetate etc.) is caused to form by passing heated gases through the mixture; these are then passed through a condenser where the volatile ester is condensed. The gases are reheated and recycled.

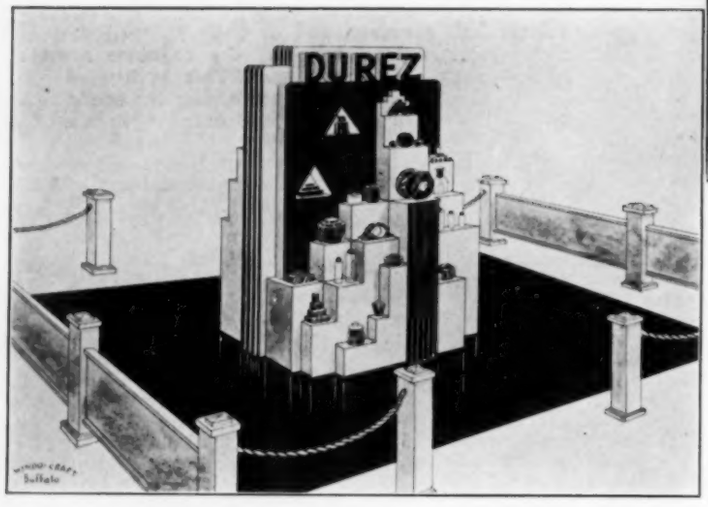
Serial No.	Patent No.	Patentee	Title	Brief of Description
221.	U. S. P. 1,546,902	J. M. Kessler (E. I. Du Pont de Nemours & Co.)	Recovery of concentrated acetic acid from mixtures containing the same.	The mineral acids in the acetylating bath are neutralized by adding sodium acetate, whereupon the resultant mixture is sprayed or otherwise applied to a moving heated surface such as a metallic ribbon or drum. This is preferably done in a vacuum, the volatilized acid and acetic anhydride, if any, being condensed. The cellulose acetate is recovered as a film, which is cut up into small pieces and bleached with water to remove soluble salts therefrom.
222.	U. S. P. 1,560,620	A. F. Sulzer (Eastman Kodak Co.)	Preparation of cellulose acetate and recovery of acetic anhydride and acetic acid.	The acid and anhydride are distilled out of the acetylating bath under vacuum at 40-80°C. The cellulose acetate is not adversely affected by this treatment.
223.	U. S. P. 1,668,482	Ruth-Aldo Co. Inc. (H. L. Barthelemy)	Preparation of cellulose acetate.	In order to decompose the cellulose acetosulfate that forms when sulfuric acid is used as a catalyst, sufficient aqueous formic or acetic acid is added at the completion of the acetylation to decompose the acetic anhydride still present. After cooling down the mixture, further quantities of formic or acetic acid are added, these containing enough hydrochloric acid to decompose the acetosulfate. The operation is carried out at 41°C. Acetone-soluble cellulose acetate results.
224.	Ger. P. 424,069	Vereinigte Glanzstoff Fabriken A.-G. (F. Paschke)	Recovery of strong acetic acid from acetylating baths.	An acetylating mixture containing, for example, 85% of free acetic acid is mixed with an equal volume of a saturated solution of sodium acetate. This forms a gel which is pressed several times, each time under increased pressure. The press-cake is then dampened with water and pressed twice at high pressure. About 50% of the acetic acid is thus recovered in strong condition.
225.	Ger. P. 440,844	Wolff & Co. (H. Schulz)	Treatment of cellulose esters and ethers, as well as of products made thereof.	The material is boiled with water or steamed either at atmospheric pressure or under vacuum. On subsequent boiling under pressure the cellulose compound will not rise to the surface nor become partly decomposed.
226.	Ger. P. 473,833	Dr. A. Wacker, Ges. für elektrochemische Industrie, m. b. H. (W. Gruber)	Method of recovery of acetic acid when preparing acetone-soluble cellulose acetate.	The finished acetylating mixture is mixed with a mixture of hydrocarbon and or their halogen derivatives, whereby the cellulose acetate is precipitated. This is filtered off. The filtrate, containing the acetic acid in solution, is treated with a little water, whereby the mixture will stratify into two layers—of hydrocarbon on the one hand and acetic acid on the other.
227.	Brit. P. 235,727	Vereinigte Glanzstoff Fabriken A.-G. (F. Paschke)	Recovery of acetic acid in strong form from acetylating mixtures.	See Ger. P. 424,069 (No. 224)
228.	Brit. P. 268,778	Society for Chemical Industry	Precipitation of cellulose acetate and recovery of acetic acid.	The acetylating mixture is distilled under a vacuum, whereby a part of the acetic acid is directly recovered as 92-93% strength acid. The residual viscous solution of the cellulose acetate is treated with water to precipitate the cellulose acetate.

229. Brit. P. 269,543	Society for Chemical Industry	Recovery of cellulose acetate.	The cellulose acetate after precipitation is subjected, for removal of adhering acetic acid, on a travelling belt to pressure from rolls, being washed with water counter-current, being finally dried on heated rolls.
230. Brit. P. 282,789	Ruth-Aldo, Inc. (H. L. Barthelmy)	Preparation of cellulose acetate.	See U. S. P. 1,668,482 (No. 223)
231. F. P. 582,554	Vereinigte Glanzstoff Fabriken A.-G.	Recovery of high strength acetic acid.	See Ger. P. 424,069 (No. 224)
232. F. P. 621,377	Societe Lyonnaise de Soie Artificielle (T. A. A. Chevallet)	Preparation of easily dyed cellulose acetate.	The precipitating baths contain glycerol.
233. F. P. 631,386	Society for Chemical Industry	Obtaining strong acetic during the manufacture of cellulose acetate.	The acelylating bath containing the already hydrolyzed cellulose acetate is distilled under a vacuum, whereby a considerable amount of the acetic acid is recovered at 92-93% strength.
234. F. P. 638,898	Ruth-Aldo, Inc.	Preparation of cellulose acetate.	See U. S. P. 1,668,482 (No. 223)
235. Swiss P. 126, 410	Society for Chemical Industry	Preparing cellulose acetate.	See Brit. P. 269,543 (No. 229)

This completes Dr. Aladin's review of the patents on cellulose acetate issued during the decade 1920-1930 in all civilized countries that issue printed patents. The article was received in handwritten form, in German, and translated by Carl Marx, Editor of Plastics and Molded Products. A complete patent number index of this review will follow in our next issue, so as to constitute this review complete in itself.

Plastic Materials Exhibited at 1932 Trade Expositions

General Plastics, Inc. makers of Durez, the phenolic molding compound from which tube, bottle and jar caps, as well as molded boxes, jars and trays are made, will use this modernistic display stand to exhibit their products in Booth 509 at the Chicago Packaging Exposition, Palmer House, March 7-12. Some of the articles to be exhibited are special molded closure designs, molded Durez gift boxes, display stands, powder boxes, manicure set cases, molded jars, and other special Durez containers. Some of the new Durez colors will also be shown.



The Bakelite Corporation exhibit at the recent Motor Boat Show held at Grand Central Palace, was devoted entirely to the new synthetic resins, which have met with such widespread acceptance as the basic element in super-quality marine finishes of all types. Included in the exhibit were a number of striking laboratory tests, demonstrating water, acid, and alkali resistance; elasticity; drying time, and other characteristics—all indicative of the extreme durability of varnishes, and enamels based on Bakelite synthetic resins.

The Molding of Modern Plastics

A Lecture-Demonstration at the Annual Meeting of the American Institute with the Assistance of H. H. Fromm, Fred S. Carver Co.

By Leon V. Quigley

Counsel on Public Relations

SO far as we know this is the first time that a public lecture audience has been given the opportunity to witness the molding of modern plastics such as Bakelite and Beetle. It is a simple rapid drama in which chemistry and mechanical engineering unite to provide a successor to the ancient potter's wheel.

Before we proceed to the actual molding operation, some of you may want to know what modern plastics are made of. Constitutionally, they are something new. Until the present century, the word *plastics* meant, to a large portion of the general public, materials like the various clays and plasters. Those plastics were always of mineral origin. Present day plastics are not dug out of the ground, nor are they gathered from trees or plants. Practically all of them are created in the chemical laboratory. They are created by the process of synthesis which implies the building up or putting together of simpler materials. It would be a long story to tell about the chemistry which underlies the process which we are going to witness. We will want to understand, however, that the older plastic materials were obtained from natural sources and about all man had to do was to fashion them into shape or form. In the case of materials like Bakelite or Beetle, the chemist creates the very material of the plastic from initial substances quite different. Then too, the formative or molding operation is not merely mechanical as was the operation on the potter's wheel. During the molding operations which we are about to witness, the final product becomes an entirely difficult chemical individual in contrast to the initial materials which go into the press.

The Hydraulic Press

Now a word about the press iteslf. When I asked Mr. Fred Carver, who devised it, how he happened to specialize in this little unit in addition to his output of large presses, he said that there had seemed to be an important need for a miniature hydraulic pressing unit which would enable chemists and engineers to experiment quickly and at minimum expense. In colleges, hospitals, and in all the research departments of industry, the Carver laboratory press can now establish the data which are the necessary groundwork for successful operation in terms of tonnage and mass production.

This little press makes one molding at a time. The big presses make a gross. But the average large press would weigh 10,000 pounds and would be too cumbersome to set up here for our lecture. In the past, therefore, audiences have had to listen to the story without seeing the actual molding operation. Formerly there was no standard miniature equipment. Not merely for demonstration, the Carver press has played a part in the development of many of the newer plastics including Plaskon and Vinylite.

Now for the molding itself. Mr. Fromm, Mechanical Engineer, associated with the Carver Company will show a typical charge of Bakelite molding material. You see, this is a powder, light in weight—something like powdered chocolate or soft coal—but in appearance only. He will now place a measured charge in the mold, that is in the lower cavity of a typical two-piece, hardened steel die. The total cavity of the die might be described as a hollow duplicate of the ashtray which we are going to make.

Photo by Cameranews

Mr. Fromm, left, operating the Laboratory Press, Mr. Quigley examining molded tray; molding powder and nest of molded trays in foreground.

Now, closing the press, Mr. Fromm will bring together the upper and lower platens of the press confining the Bakelite within the die. Electrically heated, the die is kept at a temperature of 350 degrees Fahrenheit. A pressure of 2000 pounds per square inch is being applied. Under the influence of heat the Bakelite material now softens and fills the die cavity completely. But that is not all that happens.

The Bakelite is changing chemically. Paradoxically it is freezing into solid form under the influence of heat! The fundamental resinoid base of the Bakelite is changing molecularly —polymerizing. Before this moment the resin base could be melted and dissolved, it was non-resistant to attack. Now it has been transformed so that it can never be melted, will not dissolve, and is highly resistant to nearly all deteriorating influences.

By means of the hand lever, Mr. Fromm is applying to the molded piece a pressure equal to the weight of a ten-ton Mack truck with full load. Sounds like a strong man act doesn't it? Two interesting principles of physics are being applied. By action of the lever, plus the working of Pascal's principle the power of Mr. Fromm's arm is being multiplied 155 times.

A Variety of Products

By this operation which we are witnessing are produced all of the new handset telephone instruments; the distributor heads—which are the brains of the ignition systems on all American automobiles; all radio tube bases! The applications of these modern plastics range from the instruments of the symphony to the manufacture of rayon, from door knobs to drinking tumblers, from miner's helmets to airplane magnetos. They are beginning to play an interesting role in interior decorating.

Bakelite type of plastic has its origin in two unpromising materials — carbolic acid and formaldehyde. Beetleware is made from urea and formaldehyde.

The two minutes are up. Mr. Fromm opens the press. No powder now—instead an ashtray. It is light in weight, lustrous, looks like mottled walnut, will resist the effects of tobacco, alcohol, climate — better than most materials,—or people.

These little Carver presses are also used in the making of dentures—polite name for that part of the false teeth without which they would be much falser to their trust, without which they would never be able to present a united front nor hire out for a successful job of chewing anywhere. If they're like this ashtray you may be able to throw your dentures on the floor and pick them up unbroken!

(Throws a few ashtrays on the floor. They are picked up and exhibited.)

British Trade Notes

By A. C. Blackall

British Correspondent

DURING 1931 the Chemical Research Laboratory of the British Department of Scientific and Industrial Research continued its investigation of the formaldehyde-acetone condensation, and a report on its findings will shortly be published.

Successful attempts were made at the Laboratory to prepare phenol-formaldehyde resins from the phenolic fractions of low-temperature tar. This result represents a technical advance of some importance in view of the large amount of crude phenols which would become available if low-temperature carbonization of coal was practised generally.

Safety Glass Developments

AFTER two years of research a British safety celluloid, suitable for use in the manufacture of shatterproof glass, has been successfully produced. This report was made by the Hepworth Committee, presided over by Dr. Hepworth, of the Imperial Chemical Industries combine. Hitherto, the raw materials for the manufacture of this celluloid have only been obtainable from Continental Europe, but as a result of the determination of Graham Cunningham, managing director of a British safety glass concern, to employ only domestic material for this product, the Safety Glass Committee was formed to inquire into the subject. As a result the Triplex Co., the British Xylonite Co., and Imperial Chemical Industries hope to be able to cooperate in order to produce this special celluloid locally in sufficient quantity to cope with the demand. This is of particular interest just now in view of the fact that the Board of Trade has decreed that all vehicles registered after January 1, 1932, must be fitted with safety glass windscreens.

The enforcement of this order will stimulate the demand for safety glass enormously.

Cyanides Acquires Molding Plant

LAST year proved a very difficult one for the British Cyanides Co., Ltd., according to Kenneth M. Chance, managing director. In his address at the annual meeting Mr. Chance said that there had been a heavy accumulation of stocks and that in consequence the manufacture of some chemicals would have to be curtailed until the surplus stocks were liquidated. The outlook for other chemicals was brighter. Mr. Chance declared that two types of resin are now being manufactured by the firm. These are handed over to its subsidiary, Beetle Products Co., for conversion into molding powder or for sale as resin. The two types of molding powder, Beetle and Beetle industrial, are commanding a steadily increasing sale throughout the world, but it is realized that the handling of this new type of molding powder can only be developed by cooperation with a company whose sole business is to convert molding powder into saleable moldings. The company has therefore purchased the Streetly Manufacturing Co., custom molders, and the output of Beetle moldings is increasing month by month.

What Cost Price?

Price-Cutting in the Plastics Industry Proves a Boomerang that Strikes Many, Including the Buyer

By G. K. Scribner

Boonton Molding Co.

In this interesting article, Mr. Scribner discusses a new yet basic angle of an old problem—the selfish rather than the altruistic reason for maintaining prices. One of his implications is that the company buying by the price standard assumes the risk of an unprofitable product. Since the author also has a businesslike and profitable plant, his observations deserve close study.

THE biggest paradox in price cutting is the vision that floats before the eyes of the executive who approves the plan before it is presented to the prospect. For some unknown and obscure reason he thinks and argues that if his salesman presents to the chosen prospect a quotation less than that prospect is paying his present supplier, he will accomplish a move of real benefit to himself.

He forgets entirely the fact that in ninety-nine cases out of a hundred that prospect is friendly enough with his present supplier to tell him flatly that the new prices must be met to keep the business. At the very least he notifies him that a revision of price will be required as a result of this new quotation. In the latter case it is usual to keep on notifying the supplier until the revision offered is low enough to hold the job even when no specific level is set at the very beginning.

Take It Or Leave It

The result, inevitably, is one of two choices. If the price quoted still leaves even the smallest margin of profit—and always remember that the old supplier *knows* while the new entrant merely guesses as intelligently as he can from appearances — the old supplier keeps the business at a lower return. If the price quoted is below cost the old supplier withdraws gracefully and the new entrant picks up a white elephant.

Reprisals of course are inevitable. The damaged one will await his chance and deliberately force his antagonist down to a bare profit to hold a few of his own choice items. That's quite human and blameless. The trouble is that an endless chain is set up that spirals downward to a bottomless pit that sooner or later will engulf one or both competitors.

Too many times the argument against price cutting and stealing jobs from one another has been presented on an altruistic basis. "Leave me alone in the enjoyment of my profits (?) and I'll do likewise." The sales manager who encourages competition on a price basis only, especially to-day when more business seems to be a necessity for survival, cannot be touched by an altruistic argument. He should be turned from his course by a realization of its ineffectiveness in accomplishing the purpose he has before him.

The violent price declines in several staple lines of molded products can be traced to exactly that short-sighted and stupid line of reasoning. Tube bases and clock cases have been knocked off their pedestals in just that way. Some outsider, or some insider with what he thought was an insufficient share of the market, decided to steal a march. He would cut just ten per cent off the list until he had that share, and then swing back to the market level. Forgetting entirely that the rest would follow him down—and that the price would stay down. To-day the chances are that the groups which started the price cutting are out of that particular line, having ruined it for everyone and accomplished nothing of value for themselves.

Let's limit these appeals "for the good of the industry" and force home the plain common sense notion that you cannot reach your objective by the method of slashing prices. The molder who contemplates a price-cutting campaign should pause to consider the protection of his own interests. That at the same time he protects all the rest of the trade is merely incidental to him. But such individual effort, duplicated by all sales managers, would result in safeguarding the interests of the entire industry.

The Buyer's Risk

The result to the buyer is likewise bad. No one is making an excessive profit on any job to-day. To accept prices which are made under pressure of unreasonable competitive bids leads only to possible trouble now, and in six months certain disaster.

The supplier is bound to try everything to cut corners with the result that quality slips—witness the unpopularity of molded clock cases since the price fell below the level that permitted a decent finishing job to be applied. Do not deceive yourself that you have a much

(Continued on page 123)

Prevention of Heat Marks in Molding Pyroxylin Plastic Articles

Method is Outlined in Patent of Recent Issue Assigned to DuPont Viscoloid Company

NOW that molded tooth-brush handles, such as the Tefra and similar types are becoming more numerous, processes for the molding of the pyroxylin and cellulose acetate plastics are becoming known. In the past, the pyroxylin plastics were almost without exception roughly cut ("blanked") from sheet stock, and then molded in steam-heated or hot-water heated dies. The advent of the cellulose acetate molding powders and compounds has led to the development of molding methods that are particularly suitable for these types of material; which require a somewhat different technique than do the phenolic and urea resins.

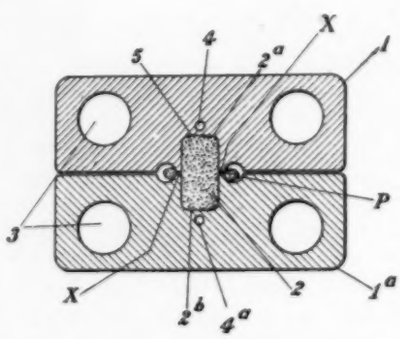
Such a method is described by James H. Sherts, of Glen Ridge, N. J., who has assigned U. S. P. 1,819,444; Aug. 18, 1931, granted to him on an invention in this field to the Du Pont Viscoloid Co.

Tooth Brush Handles

In the fabricating of pyroxylin plastic into various articles, for example tooth brush handles, it is the practice to introduce the plastic into the recess of a forming die and to press the plastic into desired shape while it is heated to a temperature such that the plastic will flow in the mold, and conform thereto, meaning by "flow" that the plastic softens and becomes shapable without, of course, becoming liquid; after which the mold is cooled to set the plastic in desired form.

In this procedure a great difficulty has been the formation of heat marks on the flat surfaces of the article, particularly in cases where these surfaces are of considerable extent and in cases where the plastic must be heated sufficiently for the closing halves of the die to cut off the plastic. When the plastic is sufficiently warm for easy cutting, it is so warm that heat marks are liable to be formed; and when it is sufficiently cool to insure the non-formation of heat marks, it is not sufficiently warm to be cleanly cut by the dies without a liability to chipping, flaking and crushing. The heat marks, to which reference is made, are small depressions in the otherwise flat surface of the plastic and their presence greatly detracts from the appearance of the goods. sometimes sufficiently to cause their rejection. Various reasons for the formation of these heat marks have been advanced, but, without regard to what the exact reason for their formation may be, I have found that they may be obviated.

One object of the present invention is to provide a process of molding plastic compositions whereby the formation of heat marks is eliminated. A further object is to provide an apparatus wherein the plastic may be molded in accordance with the indicated process.



Mold cored to permit surface chilling of pyroxylin, eliminating heat marks.

In the drawing, the figure is a vertical cross section through a mold just prior to the full closing of the halves thereof, the cavity of the mold being illustrated as filled with plastic, with the excess plastic flowing out between the mold halves and being cut off by the cutoff edges of the die.

In brief, the invention comprises locally chilling the surface of the plastic being molded, it having been found that this local chilling eliminates the formation of heat marks. Working in this way the plastic as a whole, and particularly at the points where the mold halves in closing cut the plastic, may be held at a sufficiently high temperature to permit proper conformity to the mold and to permit of a clean cutting of the plastic without crushing, with resulting chipping and flaking; and yet the surface where heat marks would be liable to occur is reduced to a low enough temperature to prevent the formation of such marks.

Coring of Mold

As here shown the mold comprises the upper and lower mold halves 1 and 1a of any suitable heat conducting material as cast iron or steel. Each mold half presents a half 2a or 2b of the mold cavity 2. Each mold half is provided, in the usual manner, with suitable passages as 3 for the passage of temperature controlling mediums thru which the mold, such as cold water and steam. But, in addition to these usual provisions 3, a mold half is provided with a

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passage 4 for the introduction of a suitable cooling medium, as a flow of cold water, this passage being arranged closely adjecent the surface 5 of the mold cavity which contacts the surfact of the plastic which it is desired to protect against heat marks. The flow of cooling medium through such passage serves to quickly and locally cool, below the general temperature of the plastic, the surface of the plastic in close proximity to the passage 4.

Other Materials

The usual plastics of the arts may be used, and broadly, the usual molding procedure. That is to say, the plastic, for example a pyroxylin plastic containing (parts by weight) pyroxylin 70, camphor 28, and residual solvent, e. g. denatured alcohol, 2, may be introduced into the mold, or superheated water, is passed through the passages 3 to heat the halves of the mold and thereby bring the plastic into such condition that it will flow in the mold and fully fill the mold cavity. The plastic is desirably heated to about 100 to 105° C. before introduction into the mold, as by heating on a hot plate or in boiling water. When the plastic has become flowable, the mold is closed, the excess plastic flowing out of the mold during the closing operation, as indicated at P in the drawing. The closing of the mold shears the excess plastic from the blank at the points indicated by XX in the drawing.

The temperature to which the mold should be raised for proper molding and shearing will, of course, vary somewhat with the nature of the plastic, the plasticizer used, and like factors, as will be understood by those skilled in the art. Generally speaking, and also for plastic of the composition above indicated, a die temperature of about 110 to 150° C. will be found satisfactory. The time of introducing the cold medium through the passages 4 may be somewhat varied, as circumstances and experience dictate. Generally speaking, the local cooling may be performed while the mold is yet being heated by steam in the passages 3 and just as soon as the die has completely closed, or just prior to the closing, care being taken, of course, that the chilling effect on the plastic shall not be transmitted through the plastic to interfere with the molding operation, or to the points XX where the plastic is being sheared until the shearing has been completed. In general, and also for plastic of the composition above indicated, the die should be locally cooled adjacent the points 4 and 4a to about 100° C. or less, thereby cooling the plastic stock to approximately 100° C. or less, at which temperature the plastic sets to a degree where heat marks do not develop.

When the mold has been closed and the plastic given sufficient time to properly distribute itself in the mold cavity, cold water is introduced into the passages 3 to chill the mold and set and harden the plastic, and after properly cooling, the mold is opened and the completed blank removed. As indicated above, the blank will be found not only properly sheared, but also without heat marks.

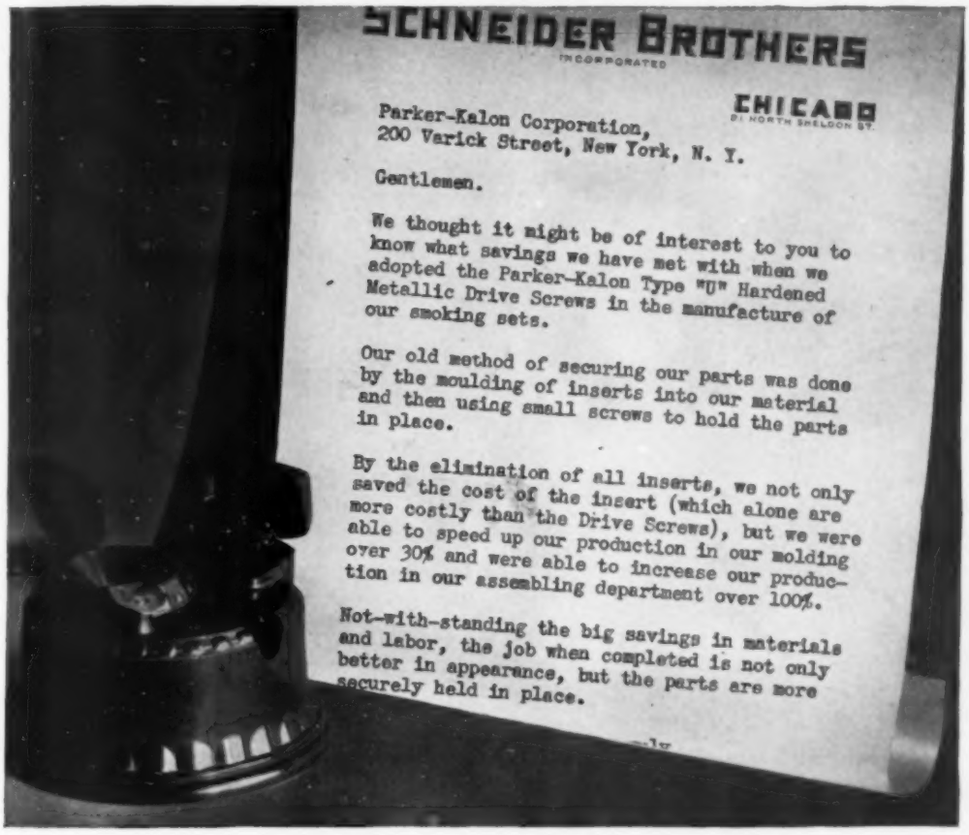
Returning to the die:—While the most desirable location of the cooling passage 4 will, of course, vary with particular curcumstances, the passage is preferably placed as close to the adjacent wall of the mold cavity as the material of the mold will permit without danger of the mold wall caving in during the pressing; thus, with a case hardened die, the circumference of the passage may be within about one thirty-second inch of the wall, but with an ordinary steel die it is desirable to make this distance about one-sixteenth inch. As the diameter of the passage, this, too, may vary with circumstances; with a die for tooth brush handles about four-tenths inch wide by two-thirds inch thick, a passage one-tenth inch in diameter is satisfactory as is also one of one-fourth inch diameter. The water flow should be such as to locally cool the die to about 100° C. in a few seconds; for instance, with a one-fourth inch passage, a flow of water under a five foot head and a temperature of about 40° to 60° F. is satisfactory.

Japanese Production and Export of Natural Camphor

THE Japanese Government owns the principal world sources of natural camphor and controls through the Bureau of Monopoly at Tokyo and the Monopoly Bureau of the Taiwan Government General the production, distribution, and sale of that product. Taiwan (Formosa), an area slightly greater than that of Maryland, is the principal source of the world's natural camphor supply. It is estimated that there are more than 4,000,000 camphor trees on that island, some of which are over 1,000 years old. Production statistics for Taiwan are not available. However, the total value of its 1930 exports of camphor, crude and refined and camphor oil amounted to $2,408,000, as compared with $3,667,000 in 1929. The shipments in 1930 were constituted as follows in quantity (kin) and value: Crude camphor, 1,332,000, $648,000; refined camphor, 816,000, $522,000; camphor oil, 4,098,000, $910,000; refined white camphor oil, 785,000, $83,000; refined Ho-white camphor, $853,000, $91,000; refined brown camphor oil, 320,000, $46,000; other camphor oil, 324,000,

(*Continued on page 129*)

FOR SPEED AND ECONOMY *in making or assembling molded, cast and laminated plastic products* INVESTIGATE SELF-TAPPING SCREWS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By the elimination of all inserts, we not only saved the cost of the insert (which alone are more costly than the Drive Screws), but we were able to speed up our production in our molding over 30% and were able to increase our production in our assembling department over 100%.

Not-with-standing the big savings in materials and labor, the job when completed is not only better in appearance, but the parts are more securely held in place.

Typical Applications

Metal screen fastened to Bakelite Molded goggles with Hardened Metallic Drive Screws.

Cover fastened to molded Durez clock case with Hardened Self-tapping Screws.

See what Schneider gains

by using Self-tapping Screws for assembling Bakelite

Schneider Brothers letter reproduced above shows how advantageously Parker-Kalon Hardened Self-tapping Screws can be used in both the molding and assembling of plastic products. Very often these Screws can be used in place of molded inserts, machine screws and rivets, to simplify design, speed-up production and materially reduce molding and assembly costs. Tests prove that Self-tapping Screws also make better fastenings. The coupon brings information.

Type "Z" *Hardened Self-tapping Screws*

For joining and making fastenings to molded, cast and laminated plastics; aluminum and die castings, sheet metal. Turn Screw into drilled or molded hole. Can be removed and replaced without impairing the holding power.

Type "U" *Hardened Metallic Drive Screws*

This type of Self-tapping Screw is for making permanent fastenings to molded, cast and laminated plastics; also iron, brass and aluminum castings and steel. Just hammer the Screw into a drilled or molded hole.

PARKER-KALON *Hardened* Self-tapping Screws

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Free Samples

Coupon below brings free samples for trial. If you attach a * description of one or more fastenings, our Assembly Engineers will report whether you can use the Screws to advantage. *Tell us—1. How fastening is now made. 2. Thickness of part to be fastened. 3. Thickness of material in which screw is to engage. 4. Kind of material. A blue print and sample of the part would assist our engineers in making helpful recommendations.

PARKER-KALON CORPORATION—Dept. B, 196-202 Varick Street, New York, N. Y.

Send information on Self-tapping Screws. Also report whether the Screws can be used to advantage for the assemblies described on attached sheet.

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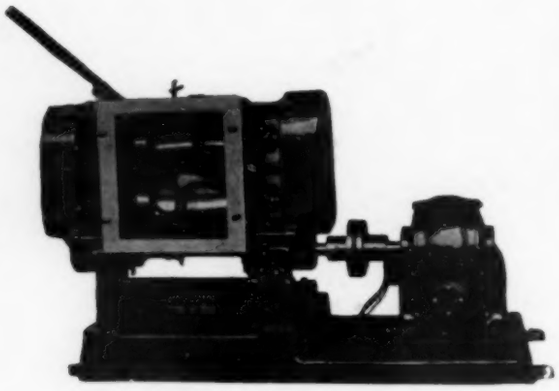

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Book Reviews

The Law of Patents For Chemists. Joseph Rossman, Ph.D. The Inventions Publishing Company, Washington, D. C. 1932. 304 pp. $3.50.

THE continued growth of interest on the part of the business world in the subject of chemistry, first awakened to the possibilities of this universal science as a result of the last great war, has also made it conscious of the part that chemistry plays in so many of our basic, as well as luxury, industries.

The large number of patents and patent applications on processes and products almost without exception involve chemical subject matter, even though they would not all be classified in the strictly chemical classification as evolved by the classification division of the Patent Office. "Chemical Patents", speaking from this point of view, involve practically all process and product patents in such diverse lines as the preparation of a new breakfast food, the production of improved forms of concrete, lacquers for motor cars and airplane wingdopes, candy-making and improvements in corrosion-resisting steel. It is thus quite evident that the chemist is playing an increasingly important field in modern industry.

The chemists' training, however, has usually been almost exclusively along the lines of pure and applied science, with little time left for even a short course in such law as might apply to his calling. As chemists are potential inventors, and in fact are often making inventions without knowing it, a concise and well written book, understandable by chemically trained persons, informing them of their rights and ways for their enforcement, became a necessity.

There had already appeared a number of books on "chemical patents", but these were written primarily for the use of patent attorneys whose knowledge of chemistry was perhaps secondary to their knowledge of law, and patent law in particular, and presumed a knowledge of such law. A book of this type is of almost no help to the chemist, and if consulted by him, usually confuses him more than ever. That this is true is shown by the occasional outbursts of "indignation" against what the uninformed chemist or technologist calls the "patent racket"; as witnessed by a page-spread editorial in a recent issue of CHEMICAL MARKETS. It appeared only too evident that the writer of that editorial had not the faintest conception of patent law, and of what was involved in the "endless delays and chicaneries" of which he complained.

Dr. Rossman's book is written from the viewpoint of the *chemist*, for the chemist, and to be used by the chemist. It is clear, concise, and, what it most important, does not require a course in general law to be understood. Since the author is a chemist, he is in a better position to appreciate just what it is that a chemist would be most likely to ask concerning patents and patent rights.

For this reason Dr. Rossman devotes a large portion of his book to such questions as "What is a chemical patent?" and "What is invention?" These questions are accurately answered and supported by numerous excellent examples. A point of particular value is the reproduction of several of the outstanding chemical patents such as the Hall aluminum patent, the "aspirin" patent and the Bakelite patent. The file-wrapper of the latter is reproduced so that the chemist, who perhaps has never seen such a document, will become familiar therewith, and will know what to expect when his attorney presents him with an Office Action.

Every important phase of patent law is covered, from the preliminary searches through to the filing, prosecution, issue, reissue and litigation of patents.

Principles of Patent Law for the Chemical and Metallurgical Industries. By Anthony William Deller. 1931. The Chemical Catalog Co., New York. 483 pp. $6.00.

PATENTS are such an important item in the development and further growth of the plastics industry, which, in its fundamental features is but a branch of the great organic chemical division of industrial chemistry, that everyone dealing with either the manufacture of the raw materials used in plastics, or the application thereof to the fabrication of the finished products should know at least some of the essentials of patentability of any products or devices that they may produce as a result of their own inventive efforts.

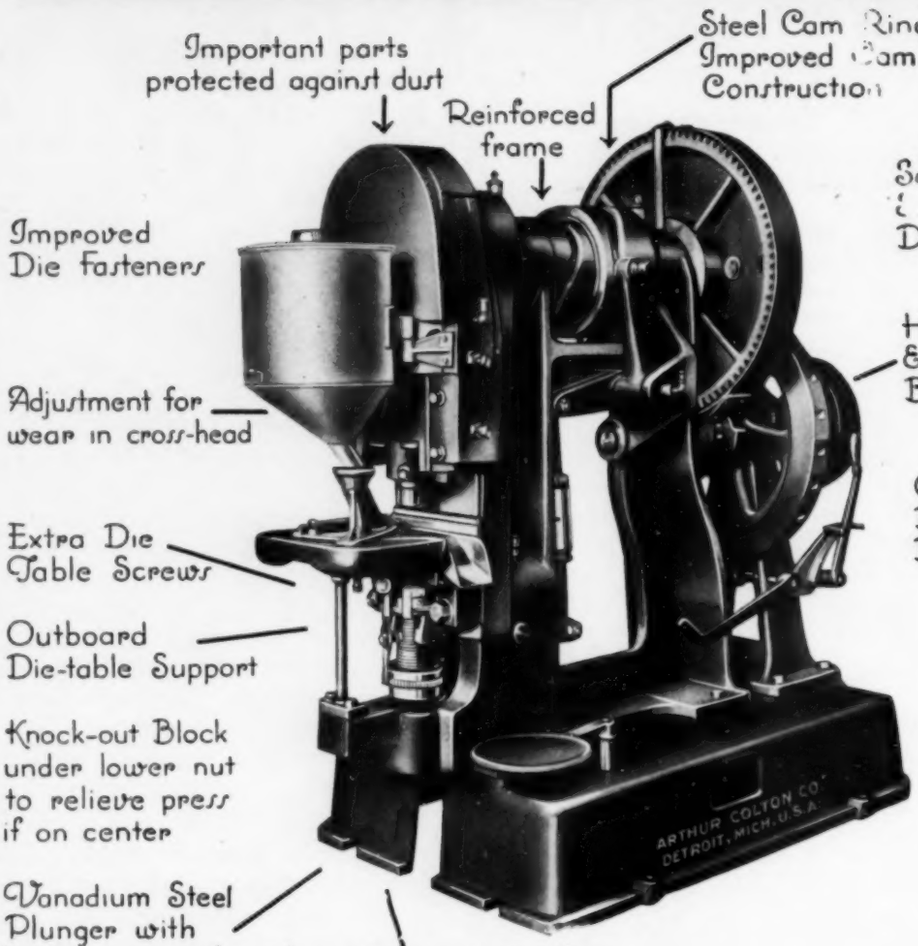
The general legal text books dealing with patent law are so far above the heads of the average layman, that they are worse than useless for him, and when consulted usually get him into such a state of confusion that he would have been better off had he let the matter alone.

There has now appeared, however, a very excellent, and, what is more important, an interesting and readable text on patent law *principles*, particularly designed for the intelligent understanding of men versed in chemistry, metallurgy and allied subjects. Mr. Anthony W. Deller is both a chemical engineer as well as a member of the New York Bar and of the Patent Bar. A careful reading of the book reveals a fund of knowledge on the subject, and a delightful style that makes the book excellent reading.

The book is far more than a

(*Continued on page 125*)

A NEW IMPROVED PREFORMING PRESS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DETROIT, MICH. U.S.A.

This is our new 5½ Tablet Machine making tablets up to 3" in diameter and having a depth of fill of 2⅛". The improvements above, with the use of a solid steel frame, insure unusually satisfactory performance.

We make a complete line of preforming machines: single punch, multiple or rotary style.

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Meets the Demand for Color

THERMO PLASTIC COMPOUND MAKALOT TRADE MARK SYMBOLIZES GREATER PRODUCTION

Beautiful Pastels in Rose, Green, Blue and Pink, in plain color or mottled combinations.

And made from phenolic resins of the same free-flowing and quick-curing type which have always characterized MAKALOT products and made them outstanding on difficult molding problems.

And the price is as attractive as the color—less than half as much as molders paid in the past for Black and Brown.

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Manufacturers Of

Synthetic Phenolic Resins, Varnishes and Molding Compounds

MAKALOT the Ideal Material for Extrusion Molding.

NEWS *of the* INDUSTRY

Du Pont Broadcasts

AN unusual and striking radio program, featuring current events and parallel historic episodes in the history of the United States, has been prepared by the du Pont Company and will be launched on the Columbia Broadcasting Chain and allied stations, beginning on Friday evening, March 4. It will be called "Today and Yesterday". Plans for the new program, which will be one of the most ambitious on the air, have been in progress for several months and include a musical setting comprising a 25-piece orchestra Miss Gladys Britain, a soprano recognized as one of the stars of radio, will be one of the features.

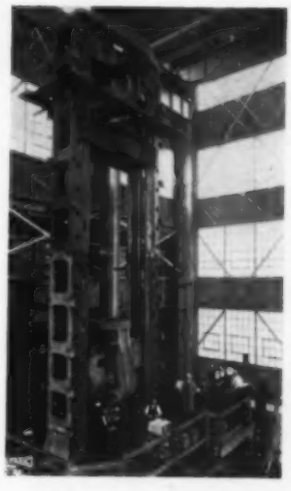
The broadcasts, starting on March 4, will take place each Friday evening at 8:30, Eastern Standard Time.

Baldwin-Southwark Ships Largest Testing Machine

THERE has just been completed in and shipped from the shops of Baldwin-Southwark Corporation, Eddystone, Pennsylvania to the University of California at Berkely, California the largest testing machine in the world. In point of dimension it is by far the largest.

It is able to test columns up to 33′-6″ long in compression and up to 4,000,000 lbs. load. In tension it accepts specimens up to 33′-6″ diminished by machine stroke and will apply loads up to 3,000,000 lb. The spread between the columns is 10 ft. and the table is 12 ft. long. Since the table is level with the laboratory floor a truck may drive between the columns and the specimen be lifted directly from the truck body by the testing machine itself.

There are many unique features of this Southwark-Emery Testing Machine in addition to its great size and unprecedented capacity. Since the principal load application is hydraulic it is necessary to provide a cylinder and ram and a pressure producing fluid pump. The ram on



this testing machine is 46 in. in diameter and the hydraulic pressure is about 2,500 lb. per. sq. in. when operating at capacity.

Chicago Molded Products Corp. Distributes New Catalog

THE new Catalog No. 101, just released by the Chicago Molded Products Corp., contains much valuable information for manufacturers, purchasing agents and engineers interested in molded plastics. It includes properties of standard molding materials, fundamental principles of mold design, list of stock parts and a description of the company's facilities.

New Type Flexible Tubing

AMERICAN Metal Hose Co., Waterbury, Conn., announces a new seamless, flexible metal tubing especially suitable for steam connections on plastic molding presses. Fittings carry iron pipe threads and the tubing is free of joints, brazes or welds. Copy of catalog sent on request.

A.S.T.M. Regional Meeting

THE third Regional Meeting of the American Society for Testing Materials is to be held in Cleveland on March 9. The sessions and dinner which make up the meeting will be in the Hotel Cleveland. A Symposium on Rubber is to be held in the morning and afternoon sessions in which outstanding authorities in this field will present papers. The meeting is being arranged by the Cleveland District Committee of the Society and the technical program is being sponsored by Committee D-11 on Rubber Products.

L. V. Quigley Sets Up Public Relations Organization

LEON V. Quigley has established his own business as Counsel on Public Relations, at 730 Fifth Avenue, New York.

During the past seven years, as technical editor of the Bakelite Corporation, Mr. Quigley has been director of public relations, publicity, and the educational program of that company. In 1925, as the result of conference among the research, sales, and advertising departments of Bakelite, he was called to the task of establishing a department of technical publicity liason between the company and its clientele. Under his direction the work of the new department developed until it drew national attention as an example of public relations work in the chemical industry.

During his connection with the Bakelite Corporation he became well known as a lecturer, appearing throughout the United States before such groups as the American Chemical Society, American Society of Mechanical Engineers, chambers of commerce, and industrial associations. In published addresses before the New York

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IN electrical switches absolute accuracy and constant uniformity are essential to secure dependable performance and complete insulation. A. R. C. Engineers will assist you in problems of this kind. For greater economy, absolute accuracy and uniformity—consult us!

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For the Critical User

THE most critical buyers prefer—even insist upon—Monsanto Phenol U. S. P. Whether for use in molded plastics, synthetic resins or chemical manufacture, the product must conform to rigid specifications.

Monsanto Phenol U. S. P. is pure, white and uniform. Exacting users depend upon it for sure and satisfactory results. Every tank car—every tin—of Monsanto Phenol must meet the same high standards. Only then are your own high standards safeguarded.

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New York Boston Chicago San Francisco

Business Paper Editors, and the Technical Publicity Association, Mr. Quigley defines public relations work as "an organized effort to coordinate an organization with its market or field of force; in modern industry, a specialized auxiliary of executive, sales, and advertising departments, cooperating with them in the increase of business through the accurate interpretation of services, and policies. Its field is broad including the study of every point of contact between an organization and its public."

Synthane Corp. Appoints Atlanta Representative

SYNTHANE Corporation, Oaks, Pa., manufacturers of Synthane Laminated Bakelite, sheets, rods, tubes, fabricated parts and Stabilized Gears, has appointed Mr. H. Douglas Stier, 101 Marietta St., Atlanta, Ga., as sales representative. He will cover the territory of Georgia and Alabama, bringing manufacturers in these states in direct contact with the services of the Synthane Corporation.

Davidson Elected Vice-Pres. of Carbide & Carbon Chemicals

ACCORDING to an announcement by Mr. J. A. Rafferty, President, Carbide and Carbon Chemicals Corporation, 30 East 42nd Street, New York, N. Y., Dr. J. G. Davidson was elected vice president of the Corporation at a meeting of the Board of Directors held on January 14, 1932. Dr. Davidson, who served the Corporation as director of chemical sales during the period 1923-30 and later, during 1930-1, as general sales manager, has been notably successful in chemical industry since the conclusion of his scientific investigations at Mellon Institute in Pittsburgh. He has devised and applied a number of novel and effectual procedures in chemical merchandising research, and has distinguished himself by utilizing effectively the results thereof in introducing new chemicals, the

scientific creations of the Carbide & Carbon Chemicals Corporation, to the chemical profession, to the industries, and to the public. In thus cultivating fields of uses for novel chemical products, he has served valuably both science and technology.

Dr. Davidson received his Ph.D. from Columbia University and then became an Industrial Fellow of the Mellon Institute, Pittsburgh.

What Cost Price?

(*Continued from page 113*)

lower overhead than your competitors and you therefore can make money at lower prices. Many is the plant that has folded up quietly as the result of that fallacy. Practically all the molders have the same average of costs. The difficulty is that they won't admit it when an order running into real money is waved in front of them. It is really marvelous to hear of the lower overhead costs that will automatically be set up "next month" when this order is in operation. The past records are completely forgotten.

Business is definitely on the upswing. In six months the molders will be busy. When they have the choice between running jobs with a profit or jobs with a loss there will be only one answer. Mysterious delays, broken promises, part deliveries will be general. The buyer has set his prices on the basis of the low quotation, and will have no place to go. Frankly, he won't like it and it will be as much his fault as the supplier's.

From now on the general level of prices will rise gradually and steadily. Those who fill their shops with cut price jobs will regret it, will perhaps pay for it with their existence, certainly with their reputations. It is very probable that this same penalty will be visited on the buyers.

Price cutting is like a shot of cocaine in the arm—just as lasting and just as healthy.

BETTER CRAFTSMANSHIP MAKES BETTER MOLDINGS

ELECTROSE

Marks of Quality in Molding

The production of the perfect molded part, from blueprints or an experimental model, requires the combined skill of toolmakers, press operators, and finishing and inspection staffs. Add to this, efficient engineering and shipping departments, and you have a complete molding service.

Our factory staff has been producing satisfactory molded parts for many years. We offer this service in molding all standard materials.

Let us quote on your molding requirements

INSULATION MFG. CO., INC.

General Insulate Co., Inc.

11 New York Avenue **Brooklyn, N. Y.**

Hydraulic Operating Valves

Fig. 1 represents a valve for operating Semi-Automatic Presses for Hot or Cold Molding, using high and low water pressures and Relief, either with or without single or double "Pull-Back" cylinders. The operating lever can be placed in any position shown in Fig. 2.

Made in several sizes for use on large or small presses.

Also Angle, Globe and Pilot Valves of various sizes, Safety Valves, and Eccentric Quick-Opening Valves.

Hydraulic Fittings, Pressure Pumps, Accumulators, Steam Plates, Etc.

Our experience of over fifty years is at your service. Let us help you solve your pressing problems.

Fig. 1

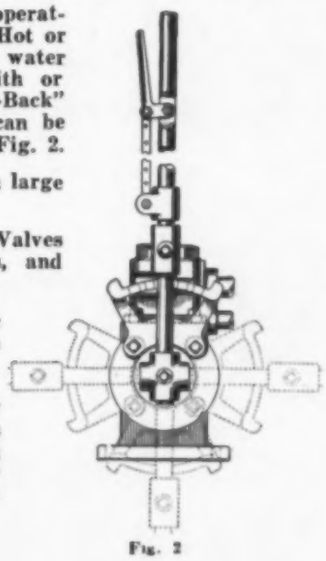
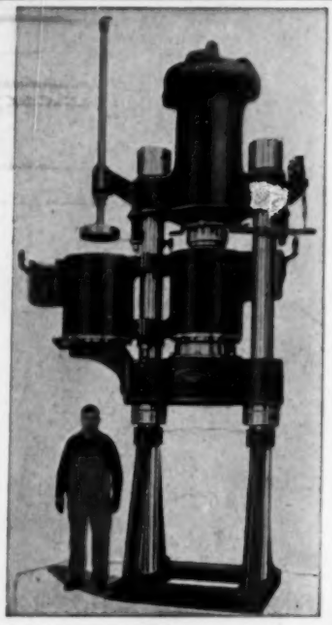


Fig. 2

Established 1872.

The Dunning & Boschert Press Co., Inc.

330 West Water St., Syracuse, N. Y.



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STEEL STEAM
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CAKE PLATES

SLICING MACHINES

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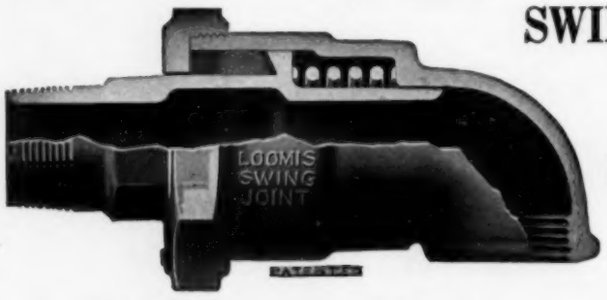

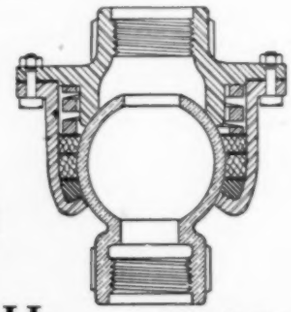

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CORRESPONDENCE

With the Editor

Dear Sir:—

This letter will probably come as a surprise to you for you know that I rarely address you on such matters.

We believe that success can best be obtained by spending all our time and giving all of our attention to our own particular problems and business. We intend to do this more intensely than ever in 1932 and we are looking forward to introducing a new idea and making an announcement in our usual quiet way in 1932 that will prove as startling as our introduction of molded closures and other original applications of the past.

At this time, in keeping with this very thought, we have deferred our actions until we could build up sufficient legal protection around our ideas as would protect them against the unethical treatments and price slashing attacks with regard to which you speak in your editorial.

Your editorial, to my knowledge and experience, is based upon facts and truths. You have hit right to the heart of the very factor that has placed this industry in its present deplorable condition, yet, I feel that you will find few who will be willing to acknowledge that you are correct because many are responsible for this very condition. Thousands of dollars in time and money have been spent, particularly in the last three or four years, through trade organization effort to prevent that very condition, which is now a reflection on the entire industry. All rules and regulations, committees and associations can only rise in accomplishment and effect to that level which they all sincerely intended they should; the low tide of profit derived and buyer's present day respect reflects the type of effort generally put forth in this industry. Absence of sincerity, judgment, and experience, intentional or otherwise, has brought about the very condition which is the subject of your editorial. You are, however, expressing in writing what we have heard many times in conversation.

Now is the time for the buyer to investigate sources of supply. Industry today is using their Credit Manager to investigate not only the credit and the financial ability of their customers but likewise of their vendors. Since a majority in our industry has served notice on the business world that we are not capable of successfully managing its affairs, I look forward to 1932 as a year in which those who are most responsible for this condition will reap their just rewards and may the chips fall where they may. (As ye sow, so shall ye reap).

Yours very truly,
Colt's Patent Fire
Arms Mfg. Co.,
B. F. Conner, Mgr.
Plastics Division.

Book Reviews

(*Continued from page 119*)

dry review of patent decisions, but, on the contrary takes the lay reader and, from a philosophical as well as practical, point of view, reveals to him the underlying principles that govern the granting of patents for inventions, both chemical as well as mechanical. He sweeps away many of the superstitions and much incorrect information that appear to be so prevalent among scientifically trained men, and still more among those who have in the past looked upon patents as a sort of a nuisance type of monopoly—when in fact they undoubtedly have been the main contributing factor to our great material and scientific advance during the past century.

For this reason, Mr. Deller has properly and profitably devoted the first fifty pages of his books to a very entertaining discussion of the history of the patent system not only of the United States, but of the Colonies and of England. He tells us that patent protection was begun as early as 1331 in England to a Fleming named John Kemp, for weaving and dyeing; and that Galileo obtained a patent in the Venetian Republic on September 15, 1594 for raising water. Many of our early colonial patents dealt with chemical inventions, as for example a Connecticut patent of 1741 to Samuel Willard *et al* for making potash.

Having inducted the reader into the proper atmosphere by this introduction, the author then takes up the question of Classes of Patentable Inventions (pp 58-136); and Persons entitled to Patents (pp 136-151). Contained in the latter chapter is a discussion of the relative rights of employers and employees— a point of much interest to every chemist and employed inventor.

The very important question of "Principles of Patentability" is the theme of the third chapter (pp. 151-221) and it is therein that the most valuable part of the whole work is to be found; for when once an inventor or investigator knows these principles, he can readily learn to judge as to whether or not he has made a patentable invention.

From the point of view of the patent attorney, the book will also be a welcome addition to the growing literature on patent law, and will be particular welcome to those attorneys who have chemical cases to consider. The reproduction of many adjudicated patent claims, particularly in process cases, add greatly to the usefulness of the book to the attorney. Printing, binding and general make-up are of the excellence that we have been accustomed to find in books put out by this publisher.

By Carl Marx

FINE HEYDEN CHEMICALS

FORMALDEHYDE
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We are in a position to meet any and all of your special requirements on these products and shall be pleased to have your inquiries.

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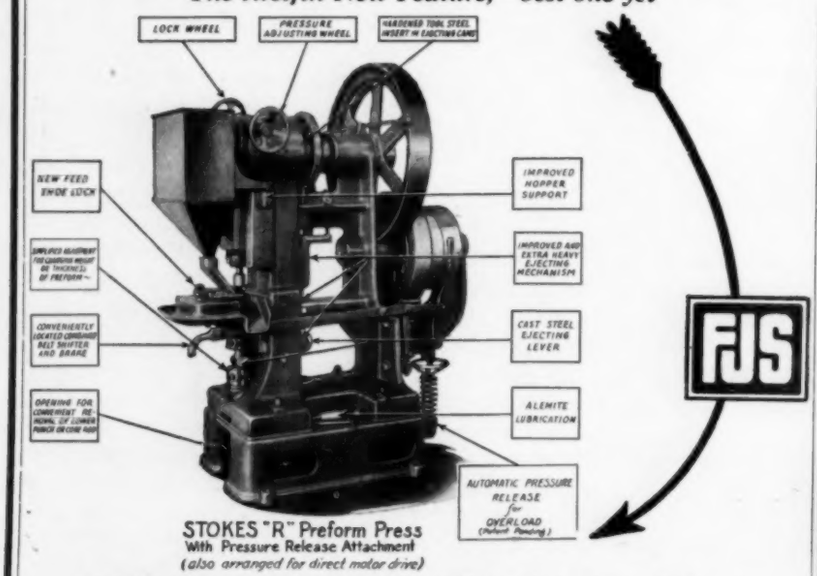
The twelfth New Feature,—best one yet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HARDENED TOOL STEEL INSERT IN EJECTION CAMS
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OPENING FOR CONVENIENT REMOVAL OF LOWER PUNCH OR CORE ROD
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FJS

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With Pressure Release Attachment
(also arranged for direct motor drive)

STOKES Automatic Pressure Release (patents pending) spills overloads and absorbs strains in preforming presses. Prevents jams and breakdowns. More than insurance, it's a necessity for uninterrupted production. Write for details today.

This essential attachment is also on all STOKES Rotary Preform Presses for production work.

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Let This Large Modern Plant *give you the service you demand on Molded Celluloid and Phenolic Compound Parts*

You have a right to expect a source of supply that is dependable—that can give deliveries when wanted, parts true to specification, of high quality material and workmanship, and at an economical figure.

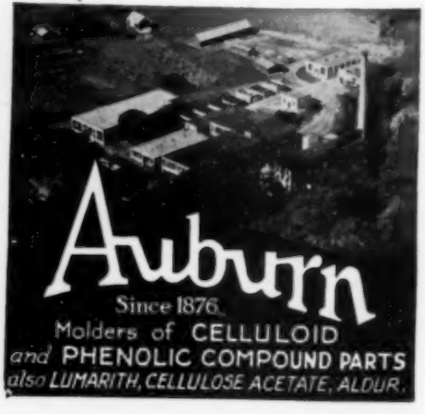
All we wish is the opportunity of proving that it is to your best interest to buy AUBURN Molded Celluloid and Phenolic Compound Parts.

The fact that most of our production is on repeat orders would indicate that we are giving complete satisfaction to the keenest buyers.

May we quote prices?

CELLULOID-BAKELITE DIVISION

Auburn Button Works, Inc.
AUBURN, N. Y.



The Plastics Industry's "Girl Trouble Shooter"

Miss Viola B. Palmgren

Has Established a Reputation in a Man-Dominated Business

ABOUT six years ago Makalot was just emerging from the laboratory stage under the direction of a German Chemist, who was having plenty of trouble. A young lady, sister of one of the assistants, often dropped into the plant after office hours while waiting to accompany her brother home. This young lady was Miss Viola B. Palmgren now well known throughout the Plastics Industry as "Miss Makalot".

As attempts at the plant to produce a saleable material resulted in failure after failure, Miss Palmgren, who lacked chemical training but was gifted with a quick, inquiring mind and a remarkable memory, began wondering what might be done to help. Many evenings, after the others had gone, she worked on the problem applying her own ideas. These experiments finally led to practical resins. Natural ability and hard work had succeeded when technical training had failed.

Miss Palmgren now became of necessity a fulltime worker at the plant and gradually learned to do everything connected with the business, including operation of the kettles, rolls and boiler, loading ball mills, grinding, blending, testing, etc. This is man's work, one would say. Yes, but not impossible for a woman who is willing, as Miss Palmgren was and still is, to don overalls and dig in through the dust, with no regrets over the inevitable soiled face and dirty hands, if results crown the efforts.

While Makalot has been constantly improved and its range of products increased under Miss Palmgren's leadership, this was not accomplished without set-backs and failures, but in her philosophy they were just part of the game, and the experience gained from them she used as stepping stones to success.

When calls came from our customers for a service representative, Miss Palmgren was often the only one at the plant capable and free to go. She was sometimes greeted with amused tolerance when she introduced herself but after smoothing out difficulties and giving valuable suggestions from her store of hard-earned information the smiles of amusement had turned to sincere respect for the "girl trouble-shooter".

Her Own Reactions

Miss Palmgren's attitude toward the work she is doing may be called both determined and modest. She says: "Not being a graduate chemist I would not attempt to enlighten the profession on the art of making Synthetic Resins, Compounds, etc. What little success I have had was due to a determined effort to make good. In working side by side with chemical engineers I have noticed that my lack of technical training was actually an asset because I would attempt things that the chemists did not believe could be done. While I realize that if I had had the benefit of a technical education I could have made some short cuts, I would not have learned many of the things that help me every day in "trouble shooting" and working out new materials. Naturally I have studied, and the chemistry I have learned will help me to accomplish new things, but I am confident I would never have perfected Makalot if I had been a chemist. Please do not get the impression I am a chemist hater, as I now find, working every day with them, that I am greatly benefited by their knowledge of chemistry, but this Synthetic Plastic business has its daily problems that can not be learned in the books."

Six years of striving to establish a business of whatever nature brings worries and heartaches which tend to sour the sweetest disposition. Miss Palmgren, however, has come through with colors flying and with the same sunny smile she had before she made the acquaintance of Messrs. Phenol and Formaldehyde.

During my several years' associations in the plastic industry, I had the opportunity of working side by side with some very good men, but these past nine months working with the only "woman expert in the Plastic Game" has demonstrated

PLASTIC MOLDING

Producers of the finest in Molded Parts for forty years

SHAW INSULATOR CO.

IRVINGTON, N. J.

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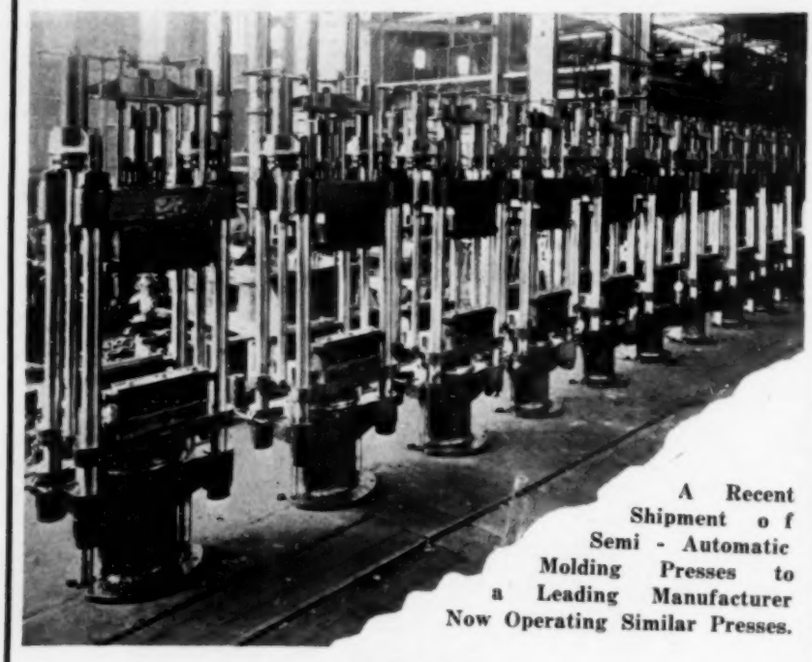

A Recent Shipment of Semi-Automatic Molding Presses to a Leading Manufacturer Now Operating Similar Presses.

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CONFIDENCE COMPLETELY EXPRESSED

You too will be satisfied with our molding equipment.

We build a complete line of plastic molding and power plant equipment.
Write for Bulletins

THE WATSON-STILLMAN CO.

118 Aldene Rd. Roselle, New Jersey

that for resourcefulness, keenness and ability to scent trouble, I have never met any one I consider her superior. And so we say in words a-la Guinan "The little girl deserves a great big hand".

Harry R. Cox

Kline Lectures on Plastics Before Standards Bureau Staff

IN a talk recently given at the regular meeting of the scientific staff of the Bureau of Standards, Mr. G. M. Kline of the organic and fibrous materials division described in detail the chemical reactions which take place in the formation of the molded or "plastic" materials which are now in common use. Mr. Kline illustrated by many formulas how different chemical elements are displaced by others to produce a material having the desired properties, such as elasticity, hardness, ease in molding, nonflammability, etc. A collection of molded articles made by the many different chemical processes was exhibited, some having the qualities of rubber.

The following grouping was used by Mr. Kline in presenting his subject: Synthetic resins (phenolic-aldehydic, amino-aldehydic, vinyl derivatives, hydroxy-carboxylic, indene derivatives); natural resins (shellac; copal, Dammar gum, rosin; asphalts); cellulose derivatives (nitrate, acetate, xanthate); and protein substances (casein and blood protein).

R. & H. Niagara Plant Holds Safety Show

OVER 2,500 employees and members of their families attended the second annual R. & H. Safety Show, held in the interest of safety and welfare by the Niagara Plant of The Roessler & Hasslacher Chemical Co., Inc., New York City, in Niagara Falls, N. Y., on February 9, 10 and 11. This show included feature acts and demonstrations by R. & H. employees, addresses on safety by plant executives, and the presentation of awards to departments with meritorious safety records.

The Latest in Packaging

(*Continued from page 104*)

and more to plastic materials. It is only a matter of months before ketchup and chili sauce manufacturers will use molded caps to replace the ineffective metal ones now in general use. Perhaps they will first be used as premiums, to adapt the present bottle to table use, but the intelligently-designed ketchup bottle with a wide mouth and a smart molded cap is coming. Similarly, mustard could have a molded cap and a molded spreader instead of the wooden one which tends to splinter and discolor in use.

Food packers are beginning to realize that the old-fashioned food package is no longer suitable for the modern dinner-table, and more and more of them are turning to redesigned containers and lustrous molded caps to make their packages appealing. The successful new food-package today is usually one designed by Walter Dorwin Teague, George Switzer, or some other competent artist. These scientifically-designed packages have the appeal that carries them through from the grocer's shelf to the festive board.

Japanese Camphor

(*Continued from page 116*)

$108,000. Direct shipments to the United States in 1930 were valued at $444,500, as against $600,000 during 1929 and $1,284,000 in 1928.

At the end of the fiscal 1929 it is understood that the Government had reforested 83,800 acres with camphor trees and that private interests in private forests had reforested 51,500 acres.

Exports of camphor from Japan declined from 5,500,000 pounds, valued at $3,100,000, in 1929 to 2,850,000 pounds, valued at $1,550,000, in 1930. The United States took slightly more than 50 per cent of the quantity shipped in 1929 and about 36 per cent in 1930.

DOW PHENOL

Dow Phenol is manufactured to exceptionally high standards of purity. It has a melting point of over 40° C., is water white in color and gives a clear water solution. Manufacturers of synthetic resins, paints and varnishes, paint and varnish removers, and numerous other products have come to rely upon its uniform high quality. It is manufactured in the largest operating synthetic Phenol plant in the world. Our large volume production insures dependability of supply in any quantity. Let us quote on your requirements.

DOW INDUSTRIAL CHEMICALS INCLUDE

Acetic Anhydride
Aniline Oil
Carbon Bisulphide 99.9%
Carbon Tetrachloride 99.9%
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Ethyl Bromide
Ethyl Chloride
Ferric Chloride
Ferrous Chloride
Monochlorbenzene
Monochloracetic Acid
Phenol
Sodium Acetate
Sodium Sulphide
Sulphur Chloride
Triphenyl Phosphate

DOW CHEMICALS

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

Branch Sales Offices: 60 East 42nd Street, New York City—Second and Madison Streets, Saint Louis

"Meet your friends at the annual dinner of the Drug Chemical & Allied Trade Section of the New York Board of Trade, to be held March 15th, 1932, at the Hotel Commodore."

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New and Rebuilt at record low Prices.

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TECHNICAL ABSTRACT SECTION

A Review of Literature and Patents

Process for Manufacturing Hydrophobe Resins by Condensation of Urea With Aldehydes. Kurt Ripper, assignor, by Mesne Assignments, to Synthetic Plastics Company, Incorporated, of New York, N. Y. U. S. P. 1,833,868; Nov. 24, 1931.

Example

A neutral or slightly alkaline mixture of 1500 parts by weight of urea and 4000 parts by weight of a solution containing 37.6 per cent by weight of formaldehyde is for short time heated in a boiler provided with a reflux condenser. After addition of 2 parts by weight of formic acid 300 parts by weight of thio-urea are introduced into the mixture in several portions, whereafter the heating of the mixture in the said boiler with reflux condenser is continued for about 1 to 1½ hours. Then about 2 parts by weight of a fixed alkali are added and the mass is allowed to cool down. After short time a white resinous product will begin to be precipitated from the neutral or slightly alkaline solution, which product remains unalterated for an extended period of time. When the resin is precipitated, for the purpose of perfecting the precipitation preferably 2000 parts by weight of water may be added and well mixed with the resin by thoroughly kneading them and the water decanted off. This manner of washing is repeated several times. The resin thus purified can now be utilized for making lacquers or hard artificial masses.

For this latter purpose the resin may be poured directly into molds and can be hardened by increasing the temperature after addition, if desired of the customary substances (filling materials, coloring matter, etc.). Moreover the resin may be freed from part of the water having remained therein by distillation effected prior to the hardening. By such distillation a highly viscous product is obtained, which at temperatures below 50° centrigrade remains in an unaltered state. Being poured into molds and subjected to increased temperatures it will soon form a clear, colorless jelly and then will harden to a solid, transparent, crystal-like mass.

Art of Preparing Nitrocelluloses and Raw Material Therefor. Milton O. Schur and Benjamin G. Hoos, assignors to Brown Co., of Berlin, New Hampshire. U. S. P. 1,833,955; Dec. 1, 1931.

Experiment has shown that through the incorporation of as low as 0.1% paraffin wax, stearic acid, or the like, in the form of a dispersion, to comparatively free pulp, followed by the fixing of the paraffin on the fibers, the sheeting of the pulp into paper, and the nitration of the paper, we may realize yields of nitrocellulose which compare favorably with those attained when the fiber is well beaten. It is thus possible to avoid the more expensive expedient of thoroughly beating the fiber prior to sheeting into paper, in order to increase yield and at the same time produce a raw material from the comparatively free fiber as suitable as that obtained from thoroughly beaten fiber.

Reducing the Viscosity Characteristics of Cellulose Ethers. Alfons Ascheri and Wolfgang Gruber, assignors to Dr. Alexander Wacker Gesellschaft fur Elektrochemische Industrie, of Munich, Germany. U. S. P. 1,834,040; Dec. 1, 1931.

The viscosity characteristics of the cellulose ethers are materially lowered by this process so that the ethers may be used for lacquers, artificial silks, films, etc., but no perceptible change in the other physical properties of the ethers is affected. The fact that the solubility of the ethers remains substantially unchanged indicates that there is no disintegration of the ethers.

This process applies to cellulose ethers generally and particularly to ethyl cellulose and benzyl cellulose.

To specifically illustrate the invention the following example is given:—

One part by weight of a cellulose ether having high viscosity characteristics is dissolved in 5 to 20 parts by weight of 80 to 100% acetic acid and is heated from ½ to 4 hours at 60° C. Then the solution, either hot either hot or cold, is precipitated by water, washed and dried. Where the concentration of the acid is of the order stated, part, at least, of the ether is dissolved, and must be precipitated by additional water after the heating. The heating can be carried out either at atmospheric pressure or in an autoclave.

Resinoid Laminated Wood Product. Jacob R. Brossman, assignor to General Electric Company. U. S. P. 1,834,895; Dec. 1, 1931.

Poplar veneer wood laminations of any suitable thickness cut to the proper size are strapped into bundles with a metal screen spaced between each lamination. The bundles are put in a steam jacketed treating tank and given the following cycle of treatment:

The wood is dried for a period of 5 hours using a 26 inch vacuum. The wood is then cooled to room temperature while the vacuum is maintained. A phenol-formaldehyde varnish having a resin content of 35% and a specific gravity of 0.92 is run in and the wood is immersed therein for at least 12 hours, a pressure of 25 pounds per square inch being maintained. The varnish is now drawn off and steam turned in the jacket. The wood is allowed to drain till the excess varnish has dripped off. The tank is then closed and evacuated. The impregnated wood is now dried for a period of 20 to 24 hours at 100° C. employing a 24 to 26 inch vacuum. The wood removed from the tank after this treatment will be found to have a resin content of about 25 to 30%. The impregnated wood may be stored for future use in moisture proof paper.

When it is desired to mold the impregnated wood, enough layers of the treated wood are stacked to allow for a 25 to 30% compression in the mold. A light coating of powdered phenolic resin is sprinkled over the surface of each layer as it is placed in the mold.

The molding operation consists in bringing the mold to a temperature of 140° C. and curing the resin under The pressure in the mold is mainper inch of thickness of material. The pressur in the mold is maintained close to 1500 pounds per square inch although variations in pressure may be necessary depending on the specific gravity of the wood. The mold is cooled to room temperature before removal of the molded wood.

Water Proof Polishing Paper. Carl Klingspor, of Siegen, Germany. U. S. P. 1,833,715; Nov. 24, 1931.

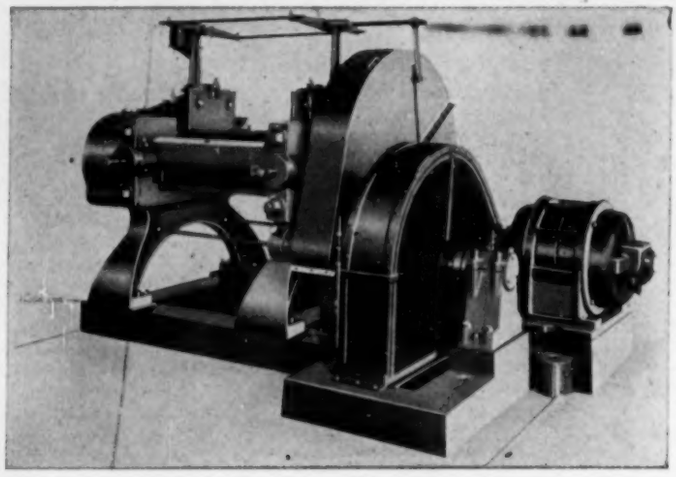
The method of manufacturing substantially waterproof abrasive sheets which comprises applying a mixture of glue, unsolidified phenol-aldehyde mixture and an alcoholic diluent to a carrier base at a moderately high temperature of about 75° C., applying an abrasive to the layer obtained on the carrier base, covering the resulting layer with liquid organic sizing material, and then gradually raising the temperature of the coated carrier base to a solidifying temperature of about 150° C. during a period of from about 10 to 36 hours.

Cellulose Sheet. Marina Gentile, of Chicago, Illinois. U. S. P. 1,832,978; Nov. 24, 1931.

As a new article of manufacture, a grease and moisture proof flexible material adapted to be used for wrapping sheets, cartons and the like, having a paper base coated with a characteristic film consisting essentially of transparent nitro-cellulose containing a modifying agent, from the group consisting of castor oil and tricresyl phosphate, that renders the film soft and pliable when dry and which causes the film to adhere evenly by penetration of the fibrous structure of the base.

Process for the Manufacture of Cellulose Acetate Film. Albert F. Sulzer, assignor to Eastman Kodak Company, of Rochester, New York. U. S. P. 1,833,136; Nov. 24, 1931.

1. A sheet material having the property of flatness in an unusual degree and having as the principal



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ingredients thereof hydrolyzed cellulose acetate having a precipitation value of at least 90% in a solution consisting of 40% water and 60% acetone at 20° C. and a plasticizer for the cellulose acetate.

2. A photographic flexible cut sheet film having the properties of satisfactory flexibility and transparency and having to an unusual degree the properties of flatness and low water permeability and having as the principal ingredients thereof hydrolyzed cellulose acetate having a precipitation value of at least 90% in a solution consisting of 40% water and 60% acetone at 20° C. and a plasticizer for the cellulose acetate.

Condensation Product and Process of Making Same. Friedrich Felix, assignor to the Firm of Society of Chemical Industry, of Basel, Switzerland. U. S. P. 1,833,245; Nov. 24, 1931.

Example

64 parts of naphthalene are sulfonated at 160° C. by means of 111 parts of concentrated sulfuric acid. The solution so obtained is cooled to 80° C. and there are added first 100 parts of sulfuric acid, and then within a few minutes 53 parts of powdered benzoin. As soon as a sample dissolves in water to a clear solution the reaction mixture is heated to 100-105° C. and there are introduced drop by drop whilst stirring 45 parts of isopropyl alcohol. The whole is then stirred for a further 1½-2 hours and is then cooled. A resinous product is obtained which is freed as far as possible from sulfuric acid and dissolved by adding 1200-1500 parts of water and sufficient caustic soda solution or sodium carbonate to produce a neutral solution; the product is precipitated from the solution at boiling temperature by the addition of 150-200 parts of common salt. After allowing the mixture to cool the product is separated by filtration and dried. It is a greyish-white powder which is easily soluble in hot water, in dilute acids and in dilute alkalies. An aqueous solution containing per litre 1 gram of the product produces a foam which is very stable and resembles in its behaviour that of a solution of soap. The capacity of solutions of the product for promoting wetting is appreciably superior to that of a product which can be made from isopropyl alcohol and naphtholene-sulfonic acid alone, and to that of a product obtainable by mixing separately prepared condensation products of naphthalene sulfonic acid with benzoin and with isopropyl alcohol respectively.

Nitrostarch Lacquer Compositions. William R. Lams and Joseph A. Wyler, assignors to Trojan Powder Company. U. S. P. 2,833,526; Nov. 24, 1931.

Dissolve 25 parts of nitrostarch and 50 parts of nitrocellulose in an equal weight, or 75 parts by weight, of ethyl acetate. This mixture upon standing will, after a time, show a separation into two components, one of which will consist predominantly of nitrostarch in solution in ethyl ace-

tate, while the other will consist predominantly of nitrocellulose in solution in ethyl acetate. We have discovered that if, to such a mixture of 25 parts of nitrostarch and 50 parts of nitrocellulose in 75 parts of ethyl acetate, there is added for example, 3.75 parts of sodium palmitate, some action of unknown nature occurs, as a result of which an entirely homogeneous and non-separating mixture occurs. The homogenizing action is very slow, and may require from three to five weeks to become complete, although the action can be hastened somewhat by employing a slightly elevated temperature, and by frequently stirring the mixture.

It will of course be understood that the example given is for purpose of illustration only, and that our invention is broadly applicable to the treatment of solutions containing both nitrostarch and nitrocellulose, in a wide variety of solvents. We may employ any of the solvents commonly used in lacquer formulation, and we may employ any of the homogenizing agents herein described, as means for promoting the homogenization of the nitrocellulose and the nitrostarch solutions.

Nitrocellulose Coating Composition. Harry M. Weber, assignor to Ellis-Foster Company, of Montclair, New Jersey. U. S. P. 1,835,105; Dec. 8, 1931.

A coating composition containing nitrocellulose, an acetylated distillate obtained from the volatile, water soluble, petroleum oxygenation products, said distillate boiling between 66 and 85° C., and an acetylated distillate obtained from the volatile, water soluble, petroleum oxygenation products and boiling between 77 and 95° C.

Plasticizer for Cellulosic Derivatives. Herman A. Bruson, assignor to Rohm & Haas Company, of Philadelphia, Pennsylvania. U. S. P. 1,835,203; Dec. 8, 1931.

108 grams of dihydroxy-stearic acid, such as is obtained by alkaline permanganate oxidation of oleic acid, are heated with stirring at 220-235° C. with 20 grams glycerol. After about 4 hours heating a clear, thin liquid is obtained which upon further heating becomes viscous and rubbery. When removed at this point and cooled, or else cut with an equal volume of toluene, a product corresponding to the "B" stage is obtained. This material may be mixed in all proportions with solutions of nitro-cellulose in the usual solvent mixture such as butyl acetate-toluene (1:1). Such solutions upon evaporation deposit a transparent, adherent flexible film if the proportion of resin to nitro-cellulose is 1½ to 1. Other proportions may be used.

If the plastic material is not allowed to cool, but is heated further for 6 or 7 hours it sets to a firm gel which can no longer be stirred. When cold, this material is a tough rubber-like mass. 100 parts of this "C" stage material is macerated on steel rollers of a rubber mill together with small quantities of toluene until the

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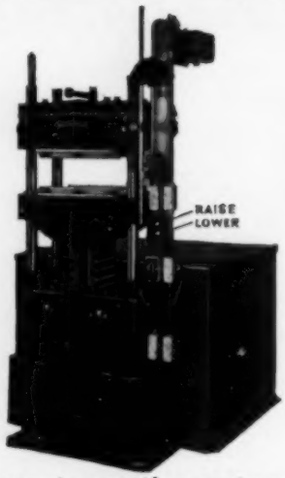

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product forms a paste which disperses completely in toluene. Such a solution resembles a solution of natural rubber. It is compatible with nitro-cellulose and may be incorporated in lacquers as outlined above.

In place of glycerol, one may use polyglycerol, pentaerithrite, mannitol or other polyhydric alcohol in the above reaction. Good results are obtained by employing sufficient polyhydric alcohol to allow an excess of hydroxyl groups over that theoretically required to combine with the carboxyl group of the hydroxy-acid used, but this is not absolutely necessary.

Furfural Resin. Gerald H. Mains, assignor to Westinghouse Electric & Manufacturing Company. U. S. P. 1,835,510; Dec. 8, 1931.

A new composition of matter comprising a condensation product resulting from the reaction of furfural and a mixture of phenolic bodies including meta and para cresols and from 5% to 25% of xylenol, and not more than 5% of ortho cresol.

Cellulose Method of Laminating Glass. Louis Bartelstone, assignor, by Mesne assignments, to Elbee Holding Corporation, of Wilmington, Delaware. U. S. P. 1,835,746; Dec. 8, 1931.

A process of conditioning a surface of glass for subsequently cementing it to a surface of celluloid, said process comprehending the deposition on said glass surface of a thin liquid film of a cellulose solution free from camphor and then converting said liquid film into a solid film free from volatile matter.

An article in the nature of laminated glass comprising external panes of glass; an intervening sheet of flexible transparent material; and a solid film of cellulose nitrate intermediate each of the contiguous surfaces, said film of solid cellulose nitrate being deposited directly upon the glass surface and being cemented to the contiguous surface of the flexible sheet.

Sulphur Plastics and Coatings Therefrom. Carleton Ellis, of Montclair, New Jersey. U. S. P. 1,835,767; Dec. 8, 1931.

On mixing one pound of the xylenol sulphur chloride resin with three pounds of sulphur and incorporating one pound of this binding agent with three pounds of asbestos fibre or a mixture of asbestos fibre with china clay, talc, powdered mica and the like, adding if desired a coloring matter such as paranitraniline red and up to say one per cent of a material such as finely powdered aluminum palmitate to overcome sticking to the molds there is obtained on hot pressing a molded article having a good surface finish and which when exposed to a good flame does not readily ignite. While the flame directly impinges on the specimen slight indications of combustion of the sulphur as shown by blue flame will be noted but on removal of the source of ignition the combustion does not spread and the flame quickly dies out.

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And Now, In Closing:

RUMORS of some new molders in the East remain unconfirmed . . . some of the estalished ones, however, are wondering where the courage came to start even a rumor! . . . The next issue of the New York Trust Company's INDEX will have a comprehensive article on plastics . . . After the last meeting, the opinion was that some of the molders were making Durez Bolder . . . Harry Randall has taken an apartment in Meriden . . . The contract season opened with lower list prices on some standard grades of material . . . and some new materials especially for the "price" buyer . . . The equipment of the Manchester (Vermont) Manufacturing Company was sold at auction . . . That of the former Pathe plant also went under the hammer . . . A temporary receiver has been appointed for Ceco . . . (Waterbury papers please copy) . . . Edward R. Wood, head of R. D. Wood & Co., and prominent in Pennsylvania politics, died in February . . . he was 91 years old! . . . American Solvents & Chemical go in bankruptcy . . . England stamps out free trade, and good old Uncle Sam immediately begins thinking of new ways to help Europe . . . According to one authority, the crisis in the Far East has been caused by the lowly soya bean, a one time plastic . . . that isn't anything compared to some of our plastic battles !

ANENT the Sino-Japanese rumpus, our Japanese correspondent, Mr. R. Sekido, publisher of the Nippon Celluloid Jihosha, digresses as follows from a business letter: "Below is out of business, but we have some very interest. We, Japan, are perfect state political and Internationship. Our land lasts twenty five hundred years. People have honor and duty, mental and physical civilization in high standard. On the other hands, "China" what is the land? We regret that Western powers took their half civilized people on an equal line with us. America will co-operate Chinese unjust? You see Chinese bandit pulled with their land, barbarous, antiforeign movement, treaty-breakers. They are old corrupted people and decomposed land. There is no real state. From the far ancient time China is entitled a sort of Republic or Compound-state. But it is *entitled*. In real meanings, they have none of Republic or Compound-state and yet modern political state. Yours faithfully".

Now do you understand?

A STUDY of the available financial reports on companies in the plastic field will prove our contention that this Industry has suffered proportionately less than business as a whole. While it is true that in some ways it has had to carry an added burden, as in the case of excess overhead and obsolete equipment, yet the bulk of its productive labor is still employed, many plants are breaking even and a chosen few are running at a profit. Those who launched new products in '30 and '31 have been hit the hardest, but these very products may mean recovery later on, since the demand for them is increasing. The biggest burden has been on the capital side. Hardly a plant that has not had to struggle under the handicap of too much, or to little, financing. They cannot all reorganize,—a fact that adds hope to the present outlook. A constriction of the Industry is inevitable, and it will take from it many whose passing will not be mourned. The others, who through experience and policies have just cause for survival, will welcome, rather than deplore, such action. On them will rest the burden of the future of the Industry, and, as George Scribner so wisely says in this issue, the "selfish" opportunity for profit.

THE plans for Ford activities were greeted with loud cheers. That the exuberence of his would-be suppliers was cut short by another announcement —that Ford would make their own electrical products—should not shorten the anticipation of increased business. This was inevitable, and many firms, such as Auto Lite, may suffer temporarily. It is inconceivable, however, that the Ford organization will not need the services of the plastic industry even more than in previous years. In fact, Ford's orders with Eastern and Middle Western molders are at present larger than expected.

More startling, even, than Ford's expansion plans is the broadening of the Woolworth prices. With the exception of standard electrical parts, very few complete plastic lines ever could reach the ten cent retail level. Increasing the selling price to twenty cents, even in only a hundred stores, will reflect a consequent increase in original cost requirements. It also means that, in many cases, the consumer will pay upwards of a dollar for a complete item. Thus does the plastic fabricator and molder enter a new market. If he is wise, he will study it immediately to see how it fits into his own production limits.